



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|-----------------------|-------------------------------|------------------------|
| 10/550,697 | 05/11/2007 | Gerrit Albert Zilvold | HMNZ 200040US01 | 4365 |
| 27885 | 7590 | 01/04/2011 | | |
| FAY SHARPE LLP 1228 Euclid Avenue, 5th Floor The Halle Building Cleveland, OH 44115 | | | EXAMINER MENDEZ, ZULMARIAM | |
| | | | ART UNIT 1723 | PAPER NUMBER |
| | | | MAIL DATE 01/04/2011 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---------------------------------------|--|
| Office Action Summary | Application No. 10/550,697 | Applicant(s) ZILVOLD ET AL. | |
| | Examiner ZULMARIAM MENDEZ | Art Unit 1723 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/30/2007; 09/27/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112, sixth paragraph

1. It is noted that the provisions of 35 U.S.C. 112, sixth paragraph have been invoked for the following limitation recited in claims 3 and 5: "means for electrically interconnecting the various adjacent electrodes".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1, 2, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zilvold (WO 98/329900) in view of Cawfield et al. (US Patent no. 5,064,514).

With regard to claim 1, Zilvold discloses an apparatus for carrying out an electrolytic process (page 1, lines, 7-8), in which apparatus several electrolytic cells are electrically connected in series (page 1, lines 8-9), which electrolysis cells each

Art Unit: 1723

comprise a cell element (page 1, lines 9-17), provided with underlying supply pipes for supplying electrolyte and with collecting discharge pipes disposed near the upper side thereof for discharging electrolyte and the gases formed during the electrolytic process (page 3, line 18 to page 4, line 34), a cathode compartment including a cathode (12) and an anode compartment including an anode (11; figure 1; page 2, lines 15-21), and a diaphragm or semi permeable membrane (page 1, lines 9-11), in which the electrolytic cells have been pressed together between two end plates (1, 2) with a certain bias, so that each anode compartment and each cathode compartment is constructed as one unit together with the supply pipes and the collecting discharge pipes (page 4, line 22 to page 5, line 7; see figure 1), characterized in that the assembly of end plates and electrolytic cells is present in a container/jacket which contains a liquid, heat-transferring medium, such as water (page 1, lines 7-14; page 4, line 35 to page 5, line 7). However, Zilvold fails to teach an electrically non-conducting cell partition being present between the cathode and the anode, which cell partition, in addition to supply pipes and collecting discharge pipes corresponding to the cell element, comprises on or more through channels for the passage there-through of the heat-transferring medium that is present in the container, which channels have been formed in the cell partition in such a manner that the heat-transferring medium that is present in the channels is not under an electric voltage, and that no liquid contact takes place between the electrolyte that is present in the electrolytic cells and the heat-transferring medium that is present in the container, outside the electrolytic cells.

Art Unit: 1723

Cawfield discloses an electrolytic cell (10) comprising an anode (21), a cathode (22), an insulating cell partition/cooling element (18, 19; col. 3, lines 57-61) located adjacent to the anode and cathode, respectively; the cooling element comprising one or more through channels (24, 26, 65 and 68) which channels have been formed in the cell partition for the passage there-through of the heat-transferring medium that is present in the container in such a manner that the heat-transferring medium that is present in the channels is not under an electric voltage - the cooling elements are made of an insulating material (col. 3, lines 57-61), and that no liquid contact takes place between the electrolyte that is present in the electrolytic cells and the heat-transferring medium that is present in the container, outside the electrolytic cells (col. 6, line 45 to col. 7, line 7). This configuration will permit the circulation of a coolant to control the heat of the electrolyzer and prevent thermal decomposition of the products (col. 3, lines 45-51). Therefore, one having ordinary skill in the art would have found it obvious to add an insulating cell partition/cooling element, as taught by Cawfield, having channels formed there-through to allow for the passage of a heat-transferring medium in order to permit the circulation of a coolant to control the heat of the electrolyzer and prevent thermal decomposition of the products.

With regard to claim 2, Cawfield teaches a reversing element (formed by disengaging element 72 and passages 74, 75, 76 for the catholyte; figure 2) is disposed adjacently to the electrolytic cell package (10), which reversing element is provided with underlying supply pipes (75, 43) for supplying electrolyte to the adjacent electrolytic cell package (10), and furthermore, with collecting discharge pipes (44, 74) disposed near

Art Unit: 1723

the upper side thereof (col. 6, line 57 to col. 7, line 7), in order to separate gases produced at the electrodes and maintain continuous recirculation of electrolyte. The reversing element is provided with one or more through channels (14), which channel (14) is designed in such a manner that no liquid contact takes place between the electrolyte that is present in the electrolytic cells and any medium outside the electrolytic cells because the anolyte and catholyte pass through their corresponding conduit as shown in figure 2. therefore, one having ordinary skill in the art would have found it obvious to add a reversing element, as taught by Cawfield, in the electrolytic cell of Zilvold in order to separate gases produced at the electrodes and maintain continuous recirculation of electrolyte. The limitations “for discharging electrolyte and the gases formed during the electrolytic process in the adjacent electrolytic cell package, for effecting the return of electrolyte from the collecting discharge pipes to the supply pipes; for the passage there-through of the heat-transferring medium” have not been given patentable weight because it has been held that the manner of operating a device does not differentiate an apparatus claim from the prior art. A recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structure limitations of the claim. See MPEP 2114.

With regard to claims 4 and 6, Zilvold discloses wherein electrolytes are discharged from the apparatus via a pipe (4) arranged in the heat transferring medium/water in the container/jacket (page 1, lines 7-14; page 3, line 18 to page 5, line 7). The limitation “so as to transfer the thermal energy contained in the electrolytes to

Art Unit: 1723

the heat-transferring medium” has not been given patentable weight because it has been held that the manner of operating a device does not differentiate an apparatus claim from the prior art. A recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structure limitations of the claim. See MPEP 2114.

5. Claims 3, 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zilvold in view of Cawfield, as discussed above, and further in view of Leduc (US Patent no. 3,421,994).

With regard to claims 3 and 5, the modified Zilvold discloses preventing exchange of electrolyte between cells but fails to explicitly teach wherein the electrically non-conducting cell partition is provided with means for electrically interconnecting the various adjacent electrodes.

Leduc teaches an electrochemical apparatus comprising a cell body containing an electrolyte and having a plurality of electrodes with respective upper sections with slots, wherein the slots of the electrodes of common polarity are aligned in the same horizontal plane, the aligned slots being adapted to receive at least one electrically conductive bar (col. 1, lines 15-39; figures 3 and 10) in order to provide an improved means for electrically interconnecting electrodes to an electrical energy source to drive the electrolytic reaction thereby (col. 2, lines 33-35). Therefore, one having ordinary skill in the art would have found it obvious to interconnect the various electrodes between the cells, as taught by Leduc, in order to provide an improved means for interconnecting

Art Unit: 1723

electrodes to an electrical energy source to drive the electrolytic reaction thereby.

With regard to claim 7, Zilvold discloses wherein electrolytes are discharged from the apparatus via a pipe (4) arranged in the heat transferring medium/water in the container/jacket (page 1, lines 7-14; page 3, line 18 to page 5, line 7). The limitation “so as to transfer the thermal energy contained in the electrolytes to the heat-transferring medium” has not been given patentable weight because it has been held that the manner of operating a device does not differentiate an apparatus claim from the prior art. A recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structure limitations of the claim. See MPEP 2114.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ZULMARIAM MENDEZ whose telephone number is (571)272-9805. The examiner can normally be reached on Tuesday-Friday from 9am to 7pm.

7. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1723

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/
Primary Examiner, Art Unit 1723

/Z. M./
Examiner, Art Unit 1723